

Appl. No.09/942,628
Amtd. dated February 21, 2006
Reply to Office action of November 22, 2005
Atty. Docket No. AP1102US

REMARKS/ARGUMENTS

In response to the objection in paragraph 2 of the Office Action, the dependencies of claims 19 and 24 have been changed so that they depend from claims 17 and 20, respectively.

The “informality” which resulted in the rejection of claims 3 and 18 in paragraph 3 of the Office Action has been resolved by inserting the term “IFFT” after the phrase “implementation of the”. This opportunity has been taken to correct some other errors of a clerical or typographical nature in claims 11, 17, 20, 30, 31, 34 and 37. These errors and corrections are considered to be self-explanatory.

Also, for greater clarity, the phrase “employing Fast Fourier Transform” has been deleted from line 2 of claim 25 because the system employs both IFFT and FFT, as detailed later in the claim. For the same reason, the phrase “Inverse Fast Fourier Transform and” has been inserted in line 1 of claim 30 and line 2 of claim 31.

In paragraph 5 of the Office Action, the examiner rejected claims 11, 15, 17, 20, 25, 30, 31 and 36 under 35 U.S.C. 102(e) as anticipated by US6,473,467 (Wallace *et al.*). This rejection is respectfully traversed. The disclosure by Wallace *et al.* is no more pertinent than the previously-cited references since it discloses the same IFFT being used for the different sub-bands.

It is noted that claims 17, 20 and 25 are independent claims to a system, transmitter and receiver, respectively, while claims 30, 31 and 36 are corresponding method claims. All of these claims require, in the transmitter, a different IFFT for each of the sub-bands and, in the receiver, a complementary FFT for each sub-band. An advantage of using different IFFTs is that there is no need to perform IFFT across the entire bandwidth. It is also possible, as specified in dependent claims, to tailor the IFFT to the number of bits in a particular sub-band. When the same IFFT is used for several sub-bands, it must cover the entire bandwidth and cannot be tailored to individual requirements of each sub-band.

Regarding the rejection of claim 17, it appears from the examiner’s statement that Wallace *et al.*’s system has “means for performing Inverse Fast Fourier Transform IFFT (FIG. 3, IFFT 320A, 320B, 320T) upon the sub-band signals using, for each sub-band signal, a respective one of a plurality of different FFTs (*sic*) (FIG. 6, FFT 614A, 614R)....” that the examiner had not noticed that the term “FFT” in claim 17 was a typographical error. As can be seen from claim 17, as amended above, the transmitter uses a plurality of different IFFTs - the receiver uses the FFTs. Consequently, the reference to FIG. 6 of Wallace *et al.*’s disclosure was inappropriate.

Even when this oversight is taken into account, it is respectfully submitted that the examiner erred in concluding that Wallace *et al.*’s transmitter uses a plurality of different IFFTs. Although FIG. 3 shows separate IFFT function boxes 320A, 320B,..., 320T, the representation is schematic.

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The separate boxes are merely a convenient way of showing that the IFFT function is carried out upon each sub-band signal. In reality, the same IFFT is used for each sub-band signal. This is apparent from the following statements by Wallace *et al.*:

IFFT 320 can be designed to perform the IFFT on any number of sub-channels (e.g., 8, 16, 32, and so on). (Column 20, lines 62 - 64).

The implementation of IFFT 320 ... is known in the art and not described in detail herein. (Column 21, lines 5 - 7).

IFFT implementations "known in the art" did not use different IFFTs for different sub-band signals; they used the same IFFT. An example of this approach is the cited reference by Kim *et al.* which states, in the abstract, that "the circuit size is drastically reduced by sharing the FFT function with other sub-channels ..." and further states, in column 9, lines 3 - 10, that "As illustrated in FIG. 5, because FFT and IFFT parts are already determined system in hardware, the system can be constructed in a FFT and IFFT shared structure by placing and operating one FFT and one IFFT, which can cover every band's FFT and IFFT size in high speed."

Since the disclosure by Wallace *et al.* does not disclose a transmitter having a different IFFT for each sub-band signal or a receiver having, correspondingly, a different FFT for each sub-band signal, it does not anticipate any of independent claims 17, 20, 25, 30, 31 and 36.

Claims 11 and 15 are dependent upon claim 30 and so include all of its features. Consequently, claims 11 and 15 are not anticipated for the same reasons.

The rejection of claims 2, 3, 10, 12, 13, 14, 16, 21, 22, 26, 27, 32, 33, 37 and 38 under 35 U.S.C. 103(a) as unpatentable over Wallace *et al.* in view of Murakami (US6,317,409) is respectfully traversed. As explained above, Wallace *et al.* do not disclose the use of a different IFFT (or FFT) for each sub-band signal. Since Murakami does not do so either, a person skilled in the art would not be led to make the combination proposed by the examiner. Even if the combination were made, it would not result in a system, transmitter or receiver having a different IFFT or FFT for each sub-band as required by the present invention as defined in claims 2, 3, 10, 12, 13, 14, 16, 21, 22, 26, 27, 32, 33, 37 and 38. Accordingly, these claims are patentable over Wallace *et al.* and Murakami whether taken individually or in combination.

The rejection of claims 18, 19, 23, 24 and 28 under 35 U.S.C. 103(a) as unpatentable over Wallace *et al.* in view of Murakami and further in view of Kim *et al.* is respectfully traversed. None of these references discloses a transmitter having a different IFFT for each sub-band signal and receiver having a complementary FFT for each sub-band signal. Accordingly, claims 18, 19, 23, 24 and 28 are patentable over Wallace *et al.*, Murakami and Kim *et al.*, whether taken individually or in combination.

The rejection of claims 29, 34, 35, 39 and 40 under 35 U.S.C. 103 (a) as unpatentable over

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Wallace *et al.* in view of Kim *et al.* is respectfully traversed. Neither of these references discloses a transmitter having a different IFFT for each sub-band and receiver having a complementary FFT for each sub-band. Accordingly, claims 29, 34, 35, 39 and 40 are patentable over Wallace *et al.* and Kim *et al.*, whether taken individually or in combination.

In view of the fact that the independent claims are patentable over the cited references, the assertions that various features of applicant's dependent claims, as regurgitated in the Office Action, are disclosed in one or other of the cited references are considered to be moot. Notwithstanding that, applicant reserves the right to address those assertions at a later date should the need arise.

Moreover, it is noted that all three of the references were granted after the filing date of the present application, so the applicant reserves the right to swear back to an earlier invention date should the need arise.

In view of the foregoing, it is submitted that all claims of record are patentable over the cited references and early and favourable reconsideration of the application is respectfully requested.

Respectfully submitted,

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